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THE MELOLONTHINE BEETLES OF THE ISLAND OF MAURITIUS, WITH A KEY TO THE GENERA AND SPECIES.

By Gilbert J. Arrow, F.Z.S., F.R.E.S.

(*British Museum* (*Natural History*))

When, in 1912, I described, as *Phytalus smithi*, a Melolonthine beetle causing very serious damage to the sugar-crop in Mauritius, which proved to have been introduced from the West Indian islands, the only related beetle previously known as an inhabitant of Mauritius was the abundant Madagascan species *Hoplia retusa* Klug. Shortly afterwards two other Melolonthine beetles also found attacking sugar-cane there were sent to me and provisionally ascribed to the genus *Rhizotrogus* with the names *Rhizotrogus gravis* and *pallens* (1919, *Ann. Mag. nat. Hist.* (9) **4** : 21), and when, in 1935, Mr. Jean Vinson published his valuable list of the Coleoptera of the Mascarene Islands (1935, *Trans. R. Soc. Arts Sci. Mauritius* **3** : 153) these two apparently indigenous insects, together with the two immigrant species, and one other not identified, were the only known representatives in the island of the great and economically important subfamily Melolonthinae. By Mr. Vinson's efforts in recent years the list, although perhaps not yet complete, has been considerably increased and at his desire I have undertaken the systematic study of the Mauritian collection of beetles of this group brought together by him, now numbering thirteen species in all. Most of the specimens were found associated with their larvae in uncultivated parts of the island, densely covered with indigenous trees and shrubs. It is reported that certain of the larvae sometimes attack the roots of sugar-cane, but the species of these have not been determined, although there is some reason to suppose that *Hyposerica vinsoni* and *H. submetallica* are among them.

The figures of genitalia accompanying this paper have been drawn by Mr. Vinson. Those of *Lachnosterna gravis* and *pallens* (figs. 2, 2*a*, 3, 3*a*), with those of some related Lamellicorn species, were published by him in 1937 (*Ann. Mag. nat. Hist.* (10) **20** : 577, 578).

The types of the new species here described, as of the Mauritian species previously described by me, are in the British Museum (Nat. Hist.) and co-types will be placed by Mr. Vinson in the Mauritius Institute.

To facilitate recognition of the Mauritian Melolonthinae I have drawn up the tabular statement which follows.

The group characters are selected as the most easily visible and convenient for the Mauritian Melolonthinae and are not to be accepted as universally applicable.

Key to the Melolonthinae of Mauritius.

A. Claws not movable ; hind tibia with two terminal spurs.

I. Labrum separate from the clypeus . . . Melolonthini

1. Antennae consisting of 10 segments . . *Lachnosterna*

1 (4) Large species, antennal club of the male long

2 (3) Broad, not pale, upper surface strongly punctured
L. gravis Arrow
3 (2) Narrow, pale, upper surface lightly punctured
L. pallens Arrow
4 (1) Smaller species, antennal club of the male short
L. vinsoni sp. n.
2. Antennae consisting of 9 segments . . *Clemora smithi* Arrow
II. Labrum united with the clypeus . . . Sericini : *Hyposerica*
1 (2) Antennae composed of 9 segments . *H. flavicornis* sp. n.
2 (1) Antennae composed of 10 segments
3 (8) Upper surface strongly punctured, not very glossy.
4 (5) Head and thorax red, antennal club of ♂ composed of 4 lamellae . . . . . *H. martialis* sp. n.
5 (4) Head and thorax not red, antennal club (♂ and ♀) composed of 3 lamellae
6 (7) Upper surface feebly metallic, clypeus of ♂ small
H. submetallica sp. n.
7 (6) Upper surface not metallic, clypeus of ♂ large
H. suturalis sp. n.
8 (3) Upper surface finely punctured, glossy
9(12) Uniformly dark above, large
10(11) Elytra feebly costate . . . *H. mauritii* sp. n.
11(10) Elytra not costate . . . . . *H. vinsoni* sp. n.
12 (9) Not uniformly dark above
13(14) Hind tibiae slender . . . *H. abdominalis* sp. n.
14(13) Hind tibiae rather short and broad . . *H. tibialis* sp. n.

B. Claws movable ; hind tibia with one terminal spur
Hopliini : *Hoplia retusa* Klug

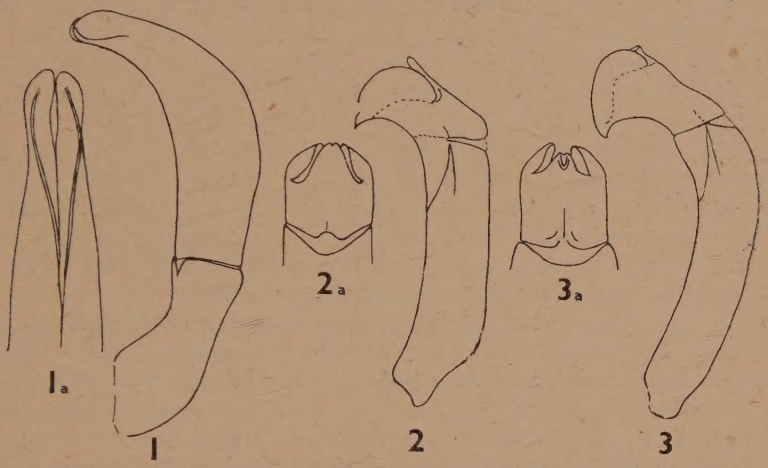
Melolonthini

The four species belonging to this section of the MELOLONTHINAE are sharply distinguished from one another and have been placed in various genera. With the exception of the introduced West Indian *Clemora* (=*Phytalus*) *smithi*, they are probably indigenous. The old genus *Phytalus* has recently been divided by Mr. Saylor between the still older genus *Lachnosterna* (*Phyllophaga*) and the newly introduced West Indian genus *Cnemarachis* Saylor, from which *Clemora* Saylor is not easily separable, Mr. Saylor stating that he would not have separated it but for certain (unnamed) differences in the larvae, which it would perhaps have been better to leave out of the question. The new species now described as *Lachnosterna vinsoni* is nearly related to certain species of the Madagascan region hitherto grouped together as the genus *Hoplochelus*. The huge assemblage of varied forms to which these belong have for many years been placed in different genera on largely geographical grounds and, having been able to discover no sufficient reason for excluding Madagascan species from *Lachnosterna*, a conclusion at which Mr. Saylor has also arrived, I now consider *Hoplochelus* a synonym of it and attribute to *Lachnosterna* the three indigenous Mauritian Melolonthini. When referring to *Rhizotrogus* the two species *gravis* and *pallens* I stated that I did so provisionally only, pending a comprehensive revision of the genera.

In Junk's Catalogue of MELOLONTHINAE by Dalla Torre the name *Lachnosterna* is restricted to the New World species and *Holotrichia* is used for those of the Old World, but the separation is an arbitrary one. The two names were introduced at the same time by Hope in 1837 (*Coleopterist's Manual* 1), in which they appear on the two sides of one leaf. When describing a few Oriental insects in 1944 (*Ann. Mag. nat. Hist.* (11) 11: 631-648), I followed the catalogue in using for them the name *Holotrichia*, but I prefer to revert to the practice of the older catalogue of Gemminger and Harold, in which *Lachnosterna* was used for both Old and New World forms, with *Holotrichia* as a synonym. Page-priority, it is hardly necessary to remark, is in fact no priority at all.

Lachnosterna vinsoni sp. n. (figs. 1, 1*a*).

Flavous, with the upper surface rufescent and pruinose in the male, pale and shining in the female, the metasternum closely clothed with pale hair, the pronotum decorated with dark marks consisting of an oblique line on each side of the middle and one or two small spots near the lateral margin, the head of the male dark.



FIGS. 1–3.—Male genitalia of: 1, 1*a*, *Lachnosterna vinsoni* sp. n.; 2, 2*a*, *Lachnosterna pallens* (Arrow); 3, 3*a*, *Lachnosterna gravis* (Arrow).

Elongate-oval, very convex; head strongly and closely punctured, the clypeus rugose, short, straight in front, rounded at the sides; pronotum sparingly punctured except at the sides, lateral margins bluntly angulate behind the middle, straight from there to the front angles, which are obtuse, and rounded to the base, the hind angles obsolete, scutellum smooth; elytra strongly but not closely punctured, with a smooth elevated costa at the sutural margin and almost obsolete vestiges of two or three dorsal costae; pygidium strongly, not very closely, punctured, the abdomen finely and sparsely punctured beneath. Antennae ten-jointed, the club very short. Legs slender, the front tibia rather feebly tridentate, the middle tibia with a complete median seta-bearing ridge, the first tarsal joint a little longer than the second, the claws strongly toothed beneath.

♂, upper surface dark and pruinose, legs long, hind femur and tibia slender.

♀, upper surface pale and shining, legs shorter, hind femur stout, tibia broad at extremity, tarsus short.

Length 21–24 mm.

MAURITIUS: Henrietta, November, 1937, a pair, communicated by the Director of Agriculture, Mauritius; Macabé Forest, March, 1940

and 1941, two males (*J. Vinson*). Bleached remains, probably very old, were also found on Corps de Garde Mountain by Mr. Vinson in December, 1945.

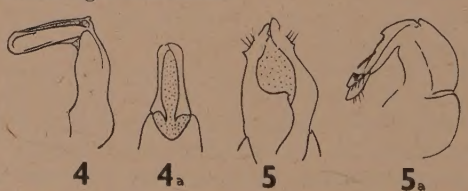
Three males were found and a single female, the latter at the same time as one of the males. The pale colour and shining upper surface of the female are in strong contrast to the same part of the male, which is dark and quite dull, but there can be no doubt of their specific identity, the patterned pronotum, quite unusual in insects of this group, being alike in both sexes. I drew attention in 1919 (*Ann. Mag. nat. Hist.* (9) **4** : 26) to the fact that the females of certain related Madagascan species were distinguished by a less closely punctured and clothed upper surface and the difference is greatly accentuated in the present species. The sexual differences are very various in the genus *Lachnosterna*, but of course useless for establishing genera.

Sericini.

A large number of genera were formulated by Brenske for the Sericini of Madagascar, most of them containing only a single species, but the great majority of species were referred to the two genera *Hyposerica* and *Comaserica*, the former bearing three teeth upon the front tibiae and the latter only two. I attribute the eight species now known from Mauritius to the genus *Hyposerica*, hitherto only known from Madagascar. It was defined by Brenske as having antennae composed of nine segments. With one exception the Mauritian representatives have ten, *H. flavicornis* alone having only nine. It would therefore be permissible to form another genus for the seven non-typical forms, but, as all agree in the essential feature of the tridentate front tibiae, while less than half of the Madagascan species included by Brenske in *Hyposerica* were known from both sexes, I do not propose to do this. The Mauritian forms have a tri-lamellate antennal club, with the exception of *H. martialis*, in which there are four lamellae in the male. I include this in the genus as the females appear to be without any distinguishing feature. It is of course possible that some of the Madagascan species of which males were not known to Brenske may also have a quadri-lamellate club.

Hyposerica flavicornis sp. n. (figs. 4, 4*a*).

Very dark brown, with the head (except the clypeal margin) and pronotum almost black, the legs and antennae light testaceous.



Figs. 4, 5.—Male genitalia of: 4, 4*a*, *Hyposerica flavicornis* sp. n.; 5, 5*a*, *H. martialis* sp. n.

Small, oval, smooth and shining, almost hairless. Antennae nine-jointed, the sixth joint minute, the club composed of three lamellae. Head short, the clypeus very shining, not very closely punctured, rounded at the sides, almost straight in the middle, forehead a little more

finely and closely punctured, the eyes far apart, not large ; pronotum finely and moderately closely punctured, the sides feebly curved in front, straight behind, the front angles short, acute, the hind angles produced, closely fitted to shoulders ; scutellum strongly and closely punctured, with the apex smooth and very blunt ; elytra rather finely and closely punctured, with four or five not well-defined dorsal striae, the sides very closely and evenly punctured, without striae ; pygidium finely, not closely, punctured ; metasternum closely punctured at sides, with a few seta-bearing punctures in the middle. Hind coxae strongly and closely punctured, hind tibiae slender, truncate, not dilated at the end, the two spurs long.

♂, footstalk of the antenna short and thick, the club three times as long and strongly curved.

♀, club of the antenna about as long as footstalk.

Length 7·5–8·5 mm.

MAURITIUS : Le Pouce (*J. Vinson* and *R. Mamet*) (*type*), December ; Piton, Grand Bassin (*J. Vinson*) October.

H. flavicornis was found in some numbers. This species, *H. submetallica* and *H. tibialis* are the smallest of the Mauritian Sericini. The present species will be easily recognised by its antennae composed of nine joints only and by the great length of the club in the male. This is relatively a little longer than that of *H. martialis* and consists of three lamellae instead of four. The footstalk is short and stout in the male and the sixth joint extremely short in both sexes. In size and shape *H. flavicornis* is similar to *H. submetallica*, but of a uniform dark brown colour and more shining, the punctures of the upper surface being less deep. It is less convex than *H. tibialis* and darker in colour. The hind tibiae are much longer and narrower.

Hyposerica martialis sp. n. (figs. 5, 5*a*).

Ferrugineous, with the antennae and legs yellow, the head, pronotum and scutellum red and the elytra dark red-brown.

Oval, not very convex, the upper surface closely punctured and scarcely shining. Antennae ten-jointed, joints 3–6 nearly equal in length, the club composed of three joints in the female and four in the male. Head short, the clypeus shining, strongly but sparingly punctured, with the margin strongly reflexed, rounded, straight in the middle, the forehead finely and closely punctured, smooth behind ; pronotum finely and closely punctured, the lateral margin gently rounded in front, straight behind, the front angle not sharp, hind angle rectangular, the scutellum finely punctured, with the sides and apex smooth and sometimes also a narrow median line ; elytra closely and evenly covered with moderately fine annular punctures, with feebly elevated sutural and two narrow dorsal costae and still narrower and less distinct indications of two lateral costae ; pygidium shining, finely and very lightly punctured ; metasternum closely punctured at the sides, with a few seta-bearing punctures in the middle. Legs slender, hind tibia narrow, its inner edge crenate.

♂, antennal club four-jointed, strongly curved, more than three times as long as the footstalk, its first lamella almost as long as the last three but only half as broad ; clypeus small and eyes large, separated by an interval only a little wider than the eye.

♀, antennal club three-jointed, about as long as the footstalk, clypeus larger than in the male and eyes smaller, the interval about equal to their combined diameters.

Length 10–11 mm.

MAURITIUS : Trou aux Cerfs (*J. Vinson, R. Mamet*), December.

Many males of this species were taken. It is unmistakable from its peculiar coloration, being red with the elytra alone dark, and the long four-jointed antennal club of the male is also quite distinctive. It is

much larger than *H. flavicornis*, the only other Mauritian species with long antennae, broader, less convex and less shining.

The peculiar form of the aedeagus, as well as the antennal club, of the male shows this to be an isolated species. The females, however, appear to show no important differential character.

Hyposerica submetallica sp. n. (figs. 6, 6*a*).

Dark brown or reddish black, with a slight metallic suffusion, sometimes scarcely apparent upon the elytra, which may be lighter in colour than the rest of the upper surface, with the antennae, tibiae and tarsi deep red.

Rather narrowly oval, closely punctured, not very shining. Antennae ten-jointed, joints 3–6 nearly equal in length, 7 minute. Head densely and rugosely punctured, with the clypeus small, the margin straight in the middle and rounded at the sides; pronotum deeply, rather finely and moderately closely punctured, the sides gently curved in front, straight behind, the front angles subacute and the hind angles bluntly rectangular, the scutellum a little depressed, deeply and irregularly punctured; elytra deeply and moderately closely punctured, with distinct juxta-sutural and one adjacent dorsal stria and only feeble traces of others; pygidium shining, finely and lightly punctured; metasternum strongly punctured, more closely at the sides than in the middle. Legs slender, the hind coxae strongly and closely punctured, the hind tibiae dilating gradually from base to extremity.

♂, club of the antenna one and a half times as long as the footstalk, eyes rather large and prominent, the interval between them about twice the diameter of one eye.

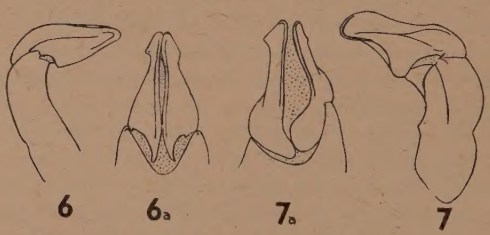
♀, club of the antenna a little longer than the footstalk, eyes small, the interval about five times the diameter of an eye.

Length 7–8 mm.

MAURITIUS: Le Pouce (*J. Vinson* and *R. Mamet*), November, December.

Four males were found at Le Pouce and a specimen of each sex, as well as larvae, were taken from fields of sugar-cane in an unrecorded locality.

This is of almost the same size as *H. flavicornis*, but a little narrower. In colour it is rather variable, but it is easily distinguishable from *H. flavicornis* by its darker legs and lower surface, the rather less shining upper surface and slight metallic lustre and especially by the much shorter antennal club of the male. The difference between the sexes in the size of the eyes is remarkable, those of the males being rather large, while those of the females are extremely small.



FIGS. 6, 7.—Male genitalia of: 6, 6*a*, *Hyposerica submetallica* sp. n.; 7, 7*a*, *H. suturalis* sp. n.

Hyposerica suturalis sp. n. (fig. 7, 7*a*).

Rusty red or ferrugineous, with the antennae and legs a little paler, the head and pronotum dark red, the scutellum red and the elytra dark red, with the entire circumference lighter red.

Oval and convex, with the legs slender. Antennae ten-jointed, the third joint a little

longer than those following, the seventh minute and the club trilamellate. Head strongly and closely punctured, clypeus broad, the margin rounded at the sides, feebly excised in the middle, the eyes small; pronotum finely and moderately closely punctured, the sides feebly curved in front, straight behind, the front angles sharp, hind angles rectangular, not sharp, scutellum finely punctured, its apex very blunt; elytra moderately finely and closely punctured, with a well-marked juxta-sutural and two slightly raised dorsal costae; pygidium shining, finely and not closely punctured; metasternum strongly punctured, sparingly in the middle, with deep median groove, not very closely punctured at the sides. Hind coxae moderately closely punctured, hind tibia slender, fairly broad at its extremity, the terminal spurs long.

♂, antennal club equal in length to the footstalk, eyes small, separated by nearly four times the diameter of one eye.

♀ unknown.

Length 9 mm.

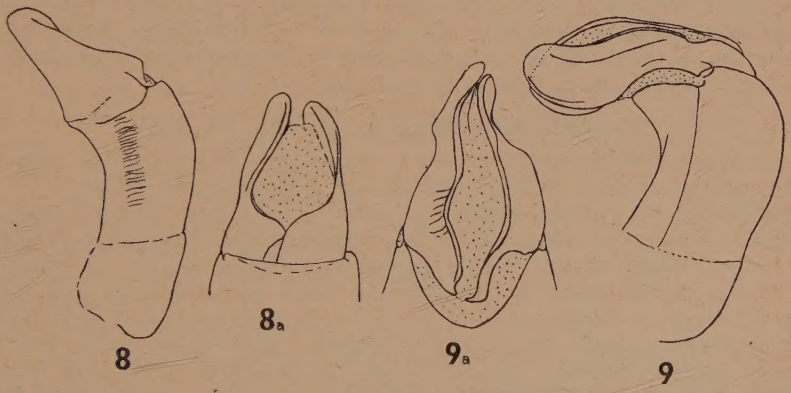
MAURITIUS: Corps de Garde (*J. Vinson*), December, January.

Two male examples only are known. Although alike in other respects, one of these is rather shining and the other quite dull upon the upper surface, perhaps as the result of attrition. They are almost of the same size as *H. martialis* and of similar colouring but with the colour differently distributed and with much smaller eyes. The antennae of the male are entirely different and the club rather short. In both specimens the red sutural margin is sharply defined.

Hyposerica mauritii sp. n. (figs. 8, 8*a*).

Black or very dark reddish black, smooth and shining above and beneath, the lower surface and legs deep red.

Broadly oval, subglobose, with slender legs. Antennae ten-jointed, joints 3–6 nearly equal, 7 minute, club trilamellate. Head strongly and closely punctured, the clypeus rather rugosely, its margin strongly reflexed, straight in front, rounded at the sides, the forehead closely punctured in front, smooth behind, the eyes rather small; pronotum finely, evenly



FIGS. 8, 9.—Male genitalia of: 8, 8*a*, *Hyposerica mauritii* sp. n.; 9, 9*a*, *H. vinsoni* sp. n.

and closely punctured, the lateral margin gently rounded in front, straight behind, the front angle not sharp, hind angle rectangular, blunt, scutellum finely punctured, with the apex and a small basal area smooth; elytra finely and evenly, not deeply, punctured, with a sutural and two dorsal costae, the latter feebly elevated, the lateral costae almost obsolete; pygidium finely, evenly and fairly closely punctured; metasternum with fine, scattered punctures and a few larger seta-bearing ones in the middle, closely punctured at the sides.

Hind tibia scarcely widened posteriorly, its longer terminal spur shorter than the first tarsal joint.

The two sexes are almost identical externally.

Length 11–12 mm.

MAURITIUS : Corps de Garde (*J. Vinson*), January.

With the exception of the closely similar *H. vinsoni*, this is the largest of the Mauritian Sericini at present known, as well as the darkest in colour and most globular in shape. It is easily distinguishable from all except *H. vinsoni*, the distinctive features of which are detailed in the following description.

Hyposerica vinsoni sp. n. (figs. 9, 9*a*).

Black or very dark reddish black, smooth and shining above and beneath, with the legs and lower surface deep red.

Broadly oval, subglobose, with slender legs. Antennae ten-jointed, joints 3–6 nearly equal, 7 minute, club trilamellate. Head strongly and closely punctured, the clypeus rather rugosely, forehead finely punctured in front and smooth behind, clypeal margin rounded at the sides, straight in the middle ; pronotum finely and closely punctured, a little more deeply than in *H. mauritii* ; elytra also more strongly punctured and the dorsal costae not elevated above the general level ; pygidium more strongly punctured. Hind tibia dilating gently from base to extremity, the longer terminal spur as long as the first tarsal joint.

The two sexes are almost identical.

Length 12–13 mm.

MAURITIUS : Macabé Forest, Alma, Midlands, Trou aux Cerfs (*J. Vinson*), December, January, February.

Seven specimens of this form were found. It has an extremely close resemblance to *H. mauritii* and the shape and colour are the same. It is a little larger and the puncturation is rather stronger and closer. The elytral costae are scarcely raised and the hind tibia is more distinctly widened towards the extremity, where the terminal spurs are longer. The male genitalia of these two closely related forms differ surprisingly, the paramera in *H. mauritii* being almost symmetrical, tapering and pointed and those of *H. vinsoni* very asymmetrical, distorted, not tapering, but broad and blunt at the end.

Hyposerica abdominalis sp. n. (figs. 10, 10*a*).

Light brown, with the head, pronotum and scutellum darker, sometimes nearly black, the legs reddish, except the femora, which, as well as the antennae, are pale.

Oval, convex, shining, with slender legs. Antennae ten-jointed, joints 3–6 nearly equal in length, 7 minute, club trilamellate. Clypeus coarsely and confluently punctured, the front margin strongly reflexed, broadly rounded, the forehead strongly and closely punctured in front, smooth behind, the eyes moderately large ; pronotum finely and evenly, not deeply punctured, the lateral margins gently curved, the front angles sharp and hind angles rounded, scutellum finely, not closely, punctured ; elytra finely, lightly and rather sparingly punctured but more distinctly in the striae, which form a sutural, two dorsal and two lateral costae, the last not well defined; pygidium very smooth, finely and sparingly punctured ; metasternum sparsely punctured in the middle, a little more closely at the sides. Hind coxa moderately punctured, hind tibia long, gradually broadening to the end, where it is truncate.

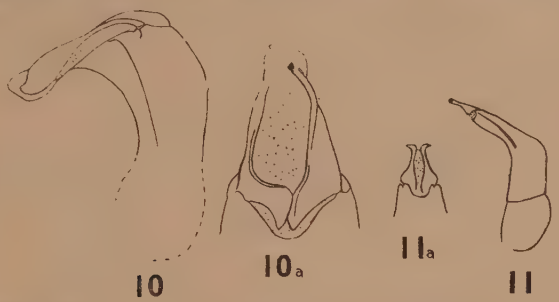
♂, last ventral sternite very short, hollowed in the middle and the cavity bounded on each side by a broadly triangular elevation.

♀, last ventral sternite smooth, broadly emarginate behind.

Length 9·5–11 mm.

MAURITIUS : Corps de Garde (*J. Vinson*) December, (*R. Mamet*) January.

A fairly abundant species. The light coloured elytra, contrasted with the dark head and thorax, together with the rather large size and glossy surface, will enable this species to be easily recognised. The thorax is rounded at the sides and its hind angles are not distinct, as usual in the genus. The club of the antenna is about as long as the footstalk in both sexes, but the males are recognisable by the last abdominal segment showing a slight hollow in the middle, bounded on each side by a small smooth elevation.



FIGS. 10, 11.—Male genitalia of : 10, 10*a*, *Hyposerica abdominalis* sp. n. ; 11, 11*a*, *H. tibialis* sp. n.

Hyposerica tibialis sp. n. (figs. 11, 11*a*).

Testaceous or light brown, with the head and pronotum usually reddish brown and the elytra sometimes dark in the sutural region, the antennae and legs pale.

Rather pear-shaped, the elytra gently widening to near the end, very convex, shining. Antennae ten-jointed, joints 3 and 4 nearly equal, 5, 6 and 7 very short, the club trilamellate. Clypeus very strongly and closely punctured, the margin strongly reflexed, gently curved at the sides, straight in the middle, forehead a little less strongly and closely punctured ; pronotum finely and evenly, moderately closely, punctured, the lateral margin gently rounded in front, straight behind, the front angle acute, hind angle rectangular, blunt, scutellum finely and closely punctured, with the apex and a small basal area smooth ; elytra with a deep juxta-sutural punctured stria and two or three pairs of similar dorsal striae, the whole surface deeply, not very closely punctured ; pygidium shining, with fine scattered punctures ; metasternum bearing a deep longitudinal groove and scattered punctures in the middle and moderately close punctures at the sides. Hind coxae finely punctured, hind tibiae short and broad, not truncate at the end but narrowed, with the inner edge curved and oblique behind the terminal spurs, which are very stout, placed one behind the other.

♂, club of the antenna distinctly longer than the footstalk.

♀, club of the antenna about as long as the footstalk.

Length 6-9 mm.

MAURITIUS : Corps de Garde (*J. Vinson, G. Morin*).

This will be easily recognised by the peculiar shape of the short and broad hind tibiae, which are obliquely narrowed at the end. Most of the seven specimens are rather light brown but the colour, as well as the size, seem to vary more than usual.

APPENDIX.

A new Melolonthine beetle from the island of Bourbon.

Mr. Vinson's important work "Contribution a l'Etude des Coléoptères des Iles Mascareignes" (1935, *Trans. R. Soc. Arts Sci. Mauritius*)

includes, besides the Coleoptera of Mauritius, those of the islands of Réunion (Bourbon), Rodriguez, etc., and an addition to the Melolonthine fauna of Réunion may perhaps be suitably recorded here. The MELOLONTHINAE of that island number, as at present known, three species only, including a single representative of the Sericini, the *Serica moreli* Coq. Another, belonging to the genus *Hyposerica*, is in the British Museum collection, where, although undescribed, it has been since 1867. This species has no close relationship to *moreli*, which belongs to the genus *Aserica*. It and one other, *A. stupida* Brenske (Madagascar) appear to be the only members of that great genus in the Madagascan region and it seems not improbable that they have been introduced either from the East or West.

Hyposerica borbonnica sp. n.

Rust red, with the lower surface, the femora and antennae a little paler.

Oval, very convex, moderately shining, almost devoid of hair above and beneath. Antennae ten-jointed, with trilamellate club. Head densely and confluently punctured, a little more coarsely upon the clypeus, of which the reflexed margin is rounded at the sides and straight in the middle, the forehead with a small smooth area in the middle behind, the eyes moderately large, separated by an interval rather wider than their combined width; pronotum strongly and closely punctured, the lateral margins very feebly curved in front and straight behind, the front angles subacute and hind angles blunt; elytra strongly, evenly, not very closely punctured, with a juxta-sutural costa, a narrow dorsal costa, a second almost obliterated upon the posterior half and two incomplete lateral ones; pygidium finely, not closely, punctured, almost smooth in the middle, abdomen finely punctured at the sides, almost smooth in the middle. Legs slender, the front tibia tridentate, hind coxa strongly but not very closely punctured, hind tibia long and narrow.

Length 10 mm.

REUNION ISLAND.

A single specimen of this species reached the British Museum in 1867 with the Bakewell collection of Lamellicornia, which included that of M. Louis Reiche. It is labelled in Reiche's writing "*furcata* Reiche. I. Bourbon." The name, like many more similarly given by Reiche, was never published. Although bearing no great resemblance to any of the Mauritian species, the tri-dentate front tibiae and ten-jointed antennae show its close relationship to them and the correctness of the ascribed habitat need not be doubted.

H. borbonnica is similar in size and shape to *H. abdominalis* and not unlike it in colour; but the upper surface is of a uniform reddish shade and the close puncturation makes it much less shining. The hind tibiae are narrower than those of *H. abdominalis*.

SUR UNE ESPECE NOUVELLE DE SCYMAENIDAE (COL.) DE L'ILE MAURICE

PAR JEAN LHOSTE.
(*Paris.*)

L'ÉTUDE des espèces insulaires est toujours d'un certain intérêt, c'est pourquoi je donnerai ci-dessous la description d'un *Euconnus* nouveau, récolté par J. Vinson dans l'Ile Maurice.

Euconnus (Napochus) vinsoni sp. n.

Long. 1·3 mm. Brun foncé, brillant, imponctué. *Tête* nettement plus longue que large, munie de deux yeux assez volumineux, placés sur les bords latéraux au quart antérieur. Pubescence latérale assez longue, drue et rigide. *Antennes* longues, de 5 à 6 dixièmes de

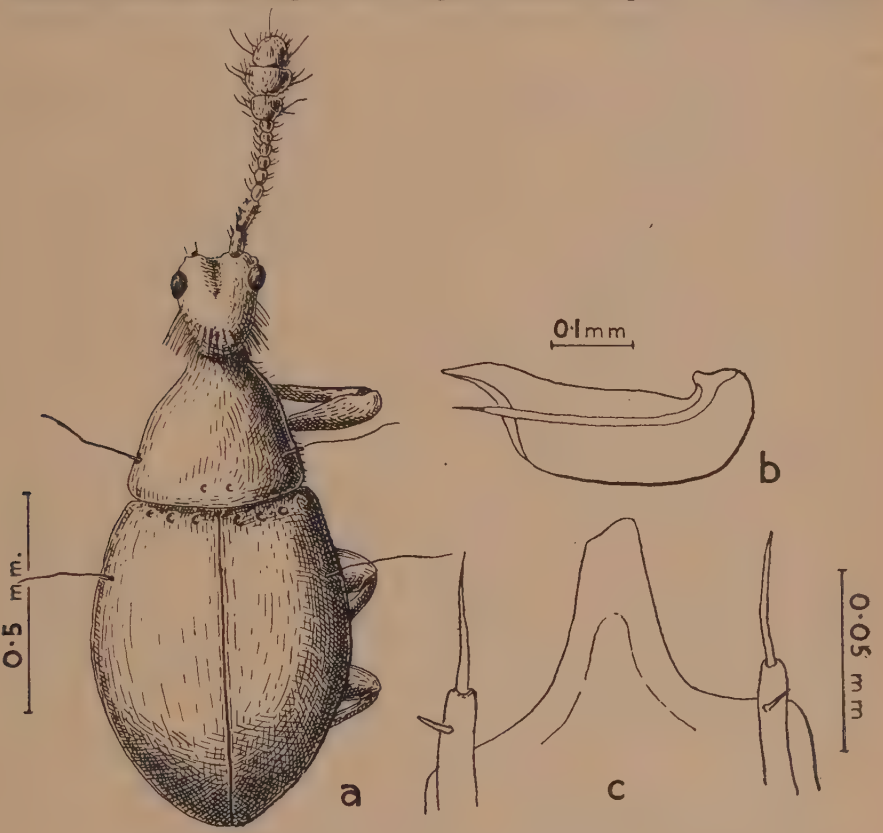


FIG. 1.—*a*, *Euconnus* (*Napochus*) *vinsoni* sp. n. ; *b*, organe copulateur mâle vu de profil ; *c*, pointe péniale vu par la face dorsale.

millimètre, à massue de trois articles : article 1 deux fois aussi long que large, article 2 semblable à l'article 1, articles 3 à 8 globuleux, garnis de quelques soies longues et arquées, articles 9 et 11 d'égal volume, article 10 plus volumineux que les articles voisins, légèrement transverse.

Pronotum tronconique, bord postérieur plus de deux fois plus large que le bord antérieur, bords latéraux légèrement convexes vers le milieu de leur longueur et munis de deux longs fouets. Base creusée de deux petites fovéoles presque effacées.

Elytres près de trois fois aussi longs que larges, régulièrement arrondis, se terminant en angle aigu. Base creusée de trois petites fovéoles. Calus huméral saillant. Ailé.

Organe copulateur mâle droit (fig. 1, *b* et *c*), muni de deux paramères terminés par une longue soie apicale. Près de l'extrémité une seconde soie, insérée à angle droit est visible. Lobe median étroit ne dépassant pas la longueur des soies paramérales.

Type ♂ du Mont Cocotte, Ile Maurice (fig. 1, *a*), conservé au British Museum.

Espèce décrite sur un individu mâle et sur un individu femelle, originaires du Mont Cocotte, Ile Maurice, et récoltés par J. Vinson, à qui je suis heureux de pouvoir dédier cette espèce.

Les indications d'habitat fournies par J. Vinson sont les suivantes : les deux individus ont été capturés à 800 mètres d'altitude, sur la crête du Mont Cocotte qui est densément recouverte d'arbres at d'arbrisseaux pour la plupart autochtones. C'est un des lieux culminants de l'île où la température s'abaisse souvent à 10° C. pendant la période hivernale. Cet habitat rappelle beaucoup le lieu de capture des espèces étudiées des îles Seychelles par H. Scott (1).

Cette nouvelle espèce est placée dans le sous-genre *Napochus* comme la forme conique du pronotum nous y engage.

Les deux espèces décrites par H. Scott (*loc. cit.*) sont assez voisines de *Euconnus* (*Napochus*) *vinsoni* tout au moins quant à la structure prothoracique et à la structure antennaire : les trois espèces ont une massue de trois articles. Par contre, la forme de la tête est très différente, transverse chez les espèces des Seychelles elle est plus longue chez l'espèce décrite ici. Cette structure céphalique a déjà été rencontrée chez deux espèces décrites d'Extrême-Orient : l'une de Ceylan, *E.* (*N.*) *nalandae* Lhoste (2), l'autre de Java, *E.* (*N.*) *gedensis* Lhoste (2). Mais les organes copulateurs mâles comparables pour ces deux espèces ne sont pas d'une structure semblable à celle de *E.* (*N.*) *vinsoni*. L'aedéage de celui-ci rappelle l'organe de *E. capensis* Lhoste (3) décrit du Cap, mais la tête est semblable à celle des espèces des Seychelles. *E.* (*N.*) *rariclava* Lhoste (4), de Sumatra, est également à rapprocher de ces espèces.

Pour le moment il est encore pratiquement impossible d'établir une classification logique du genre *Euconnus* Thomson qui se révèle être composé d'un grand nombre d'espèces dont les caractères sont excessivement variés. Il est également prématuré d'émettre des opinions quant aux affinités des espèces des Mascareignes et du Continent.

References.

(1) 1922, *Trans. linn. Soc. Lond.* (Zool.) **18** : 218, 219.
(2) 1939, *Arb. morph. taxon. Ent. Berlin-Dahlem* **6** : 5.
(3) 1939, *Arb. morph. taxon. Ent. Berlin-Dahlem* **6** : 2.
(4) 1939, *Arb. morph. taxon. Ent. Berlin-Dahlem* **6** : 285.

THE CULICIDAE (DIPTERA) OF DARFUR PROVINCE, ANGLO-EGYPTIAN SUDAN, WITH OBSERVATIONS ON THE GEOGRAPHY AND ZOOGEOGRAPHICAL RELATIONS OF THE REGION.

By P. H. Abbott, B.A.(Camb.), M.R.C.S., L.R.C.P., F.R.E.S.
(*Sudan Medical Service.*)

There have been few records of mosquitoes from Darfur Province. Lying as it does at the northern limit of the Ethiopian region and including in its centre the Marra Mountains rising to over 10,000 feet, with permanent surface water and a climate more temperate than can be found for many hundreds of miles in any direction, it would be expected to show the presence of some interesting species.

Edwards (1941) in his discussion on the zoogeography of Ethiopian mosquitoes states that further records are needed from Jebel Marra, and it will be seen that the species to be found on this isolated massif are of very great interest in this connection.

In this paper are recorded two forms of Culicidae additional to the 136 noted by Lewis (1945) as known to occur in the Anglo-Egyptian Sudan, and the record of *Culex* (*Neoculex*) *arbieeni* Salem, previously based on the finding of one damaged larva in Jebel Marra, is confirmed by the examination of numerous larvae and some adults.

Description of the Area.

(*a*) *Geographical Position.*

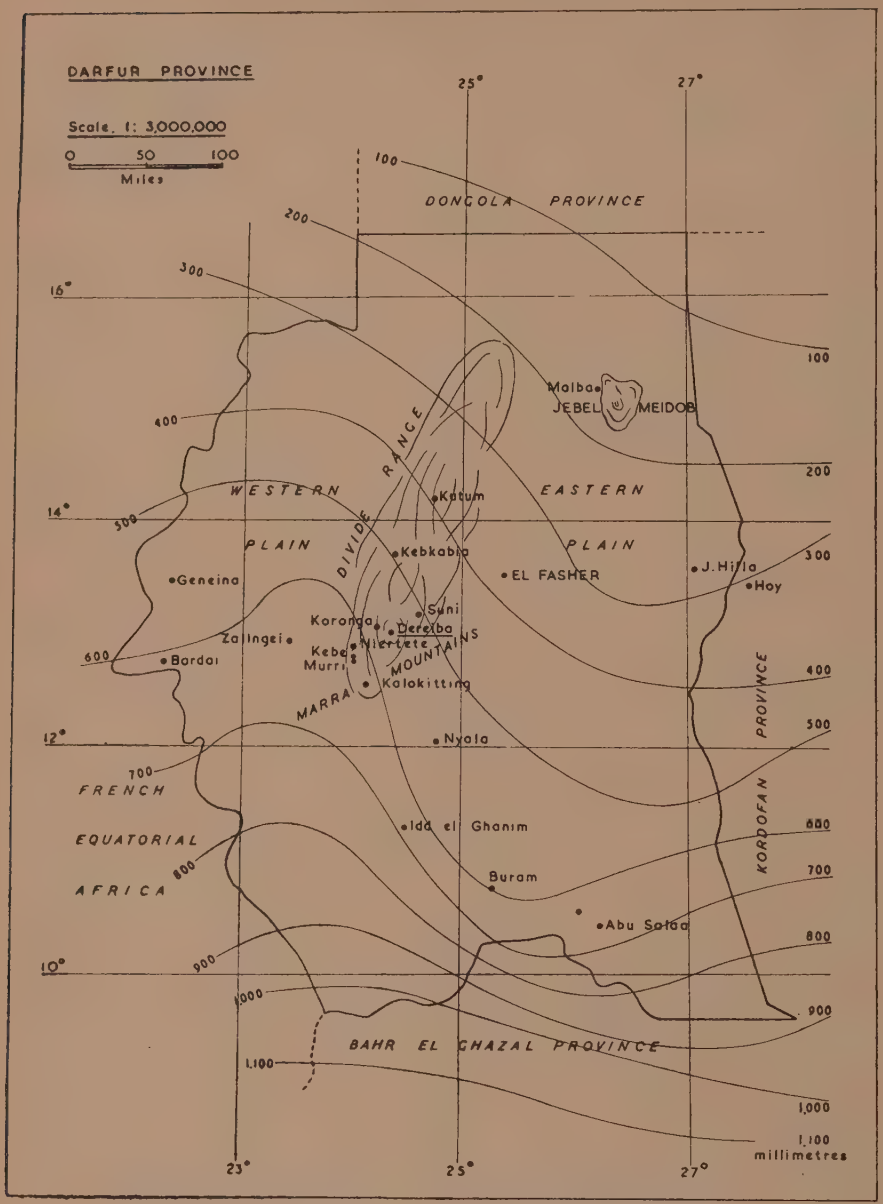
Darfur is the most westerly Province in the Sudan. Its position is interesting, for it is bounded to the north by the southern fringe of the arid Libyan Desert, to the west by the great Chad basin of French Equatorial Africa, to the south by the swamp area of the Sudanese Equatorial Province, through which run the innumerable tributaries of the White Nile, and to the east by the sandy bush country stretching through Kordofan Province to the river. It may thus be described as an area of geographical transition, so different are the conditions to be found on each of its boundaries.

The Province is approximately rectangular in shape. 450 miles from north to south, 350 miles from east to west, it covers an area of about 140,000 square miles.

(*b*) *Geological Features.*

The greater part of the area is covered with sand ; the "continental" sand which moved south from the vast desert areas, probably airborne by the Trade winds during the dry periods of Glacial times. We find the southern border of the sand at about 10° 30′ N., and south of this the soil is mainly composed of ancient clays.

The most striking physical feature and the most interesting from an entomological point of view is the Darfur Divide Range, a line of volcanic



Rainfall map of Darfur Province, Anglo-Egyptian Sudan.

mountains and hills running north and south in the western part of the Province. With peaks of 6,000–7,000 feet and ending in the great massif of Jebel Marra which rises to 10,200 feet, this range forms the watershed between the Nile and the Chad basin and exerts a great influence on the climate and water-supply of the Province generally. The "continental" sand extends down the east and west sides of the range, but not into it. More will be said of the massif later.

To the east of the range a plain slopes gradually to the border of Kordofan Province. Composed mainly of sand intersected by wadis and "khors" (water courses which are usually dry), the surface is relieved by flat mud pans lying in saucer-shaped hollows, large and small. It is probable that they had their origin in the bottom of lakes during the ancient wet periods, and they now form marshes and ponds during the rains and are dry during the hot season.

From this eastern plain rise numerous small peaks ; all are volcanic and many take the form of "volcanic plugs." To the north-east, standing separate from the main Divide Range, the Meidob massif of mountains rises to 7,000 feet, and constitutes the last hills to be found for many hundreds of miles in a northerly direction.

To the west of the range the land slopes towards the Chad valley. It is similar to the eastern plain in its surface sand and mud pans but is, however, a far richer land on account of the greater rainfall and the presence of large wadis running from the mountains, with forests and bush on their banks.

(*c*) *Rainfall and Vegetation.*

The rainy season in Darfur Province lasts approximately from June to September and the rest of the year is dry. The rains tend to start earlier in the south and are variable from year to year and place to place.

From a yearly average of less than 100 mm. in the north, the rainfall increases progressively southwards until it reaches more than 800 mm. on the southern border. Most of the rain falls as a result of sharp, heavy local storms, which cause the mud pans to fill and the khors and wadis to flow intermittently. In the Divide Range, however, and to the west, rivers flow for weeks at a time and from the higher slopes of Jebel Marra permanent streams run all the year, swelling during the rains and diminishing to trickles during the dry season, to fade into the sand not many miles from the base of the mountain.

In the dry season all surface water disappears except for the streams of the Marra Massif, a few isolated springs in the northern part of the Divide Range, springs in Jebel Meidob, and a few small permanent lakes to the west of the mountains and in the south of the province. In the rest of the country the people obtain water from wells or store it in the hollow trunks of Baobab trees.

Thus to the east of the range, with the exception of the springs in Jebel Meidob, there are no suitable breeding places for mosquitoes save the wells and the cattle troughs around them, the water in domestic utensils and that stored in trees.

The vegetation covering the eastern plain is mainly composed of bush scrub, thorn trees, and savannah grass. On the banks of the wadis, however, and in the mud pans larger trees are supported by the increased moisture and relieve an otherwise monotonous and unfriendly countryside. The density of this vegetation varies with the rainfall and consequently with the latitude. To the north it fades out into the desert ; to the south the areas of mud support forests of increasing size and the bush becomes thicker and taller.

The vegetation to the west of the range is again similar though much

more luxurious due to the greater rainfall and the presence of the larger wadis, though this too fades into the desert to the north.

The volcanic hills of the Divide Range, with the exception of the Marra Massif, which will be described later, carry scrub similar to the plains, but beside the springs and in the valleys may be found a richer vegetation with trees and small woods.

(*d*) *The Marra Mountains.*

From the eastern side of the southern end of the Divide Range rises the great block known as Jebel Murra, or more correctly the Marra Mountains. Fifty-four miles long from north to south and twenty-five miles wide, this massif rises to over 10,000 feet and is the highest mountain in the western Sudan. It is, in the main, composed of igneous rock covered with lava and tuffs of soft pumice.

The sides slope quite gradually up to the central downs, a flat area lying at 8,000 feet and surrounded by peaks. A "waist" of pumice, deeply scored by ravines, separates it from the south-western block which is topped by a large volcanic crater approximately a mile in diameter. Inside this main crater rises a small central cone of more recent origin, and in this cone lies a lake of hot fresh water, while between the inner cone and the wall of the main crater a second lake, cool but extremely saline, fills a third of the circumference. From the edges of the main craters run a few fresh water springs to feed the lakes.

The annual rainfall on the mountain is greater than that of the surrounding country and light rains are said to occur at all seasons of the year. I myself have experienced showers in March when the rest of the land lay yellow and parched. This rain feeds permanent springs which arise from the upper slopes of the mountain, and streams from these run to its foot. In places they course through narrow ravines cut in the soft pumice, in others they widen to form marshy areas fringed with green grasses and trees, whilst elsewhere they gurgle through rocky glades and over waterfalls until at length they sink into the sand surrounding the base of the mountains and run under the wadis, to be tapped by wells as far afield as Nyala, eighty miles away.

The vegetation on the mountain gradually changes as one climbs. The lower slopes, lying at 3,000–5,000 feet, carry the thorny scrub and acacia trees similar to the surrounding country, but above this the thorns diminish, more temperate trees appear, and the Euphorbia tree is found poking its grotesque arms to the sky. In the upper temperate zone from 2,000 feet to the peak, all thorny plants have disappeared save the occasional "Haraz" bush on drier surfaces. Wherever there is sufficient water, ferns, bracken and soft grasses abound, and an occasional fig tree throws its shade. In this upper zone the air is cool during the day and the nights are cold. In the winter the temperature frequently drops below freezing point.

Notes on the Species.

The following species were recorded in the province. It must be noted that the majority of records were made in the dry season, as the rains make travel in many parts of the province almost impossible.

(*a*) *General.*

Anopheles (*Myzomia*) *funestus* Giles.

A single larva almost certainly of this species was taken at the edge of a permanent stream running through a marsh at Kalokitting, 4,400 feet, on the slopes of Jebel Marra.

It is interesting to note Leeson's (1937) remark that its altitudinal range in East Africa extends from sea-level to 6,500 feet.

Distribution : Kalokitting.

Anopheles (*Myzomia*) *leesoni* Evans.

No further specimens have been taken since the larva, apparently of this species, noted by Lewis (1945).

Distribution : Niertete, at base of Jebel Marra, 5.ii.44.

Anopheles (*Myzomia*) *marshalli* Theobald.

A single larva taken at the edge of a sluggish stream fits exactly the description of Evans (1938) except for the dimensions of the tergal plate on segment 5 which covers half the distance between the palmate hairs.

Distribution : Koronga, Jebel Marra, 5.iii.45.

Anopheles (*Myzomia*) *rupicolus* Lewis.

Numerous larvae were taken in a permanent rock pool fed by a spring. The identification was confirmed by the examination of adults bred from the batch.

The occurrence of this species in Jebel Meidob, several hundred miles to the west of other known localities, is of interest.

Distribution : Malha, Jebel Meidob.

Anopheles (*Myzomia*) *gambiae* Giles.

This is the commonest anopheline ; distributed throughout the province with the exception of the Marra Mountains, on which it has not yet been found.

During the dry months of the year the arid eastern plain with its few wells does not appear to support *Anopheles gambiae* and it is always a wonder that this species should become widespread so soon after the rains begin. The simplest explanation is that it spreads from pool to pool from the permanent water at the foot of the Divide Range and from pools near the southern border of the province.

It is the only malaria sector of importance in the area.

Distribution : Widespread.

Anopheles (*Myzomia*) *cinereus* Theobald.

Found in great abundance on the middle and upper slopes of Jebel Marra. Larvae were found breeding chiefly among the weeds and grass at the edge of swift running streams, but occasionally in more stationary backwaters choked with reeds.

Distribution : Jebel Marra, Deriba (8,000 feet), Koronga and Suni.

Anopheles (*Myzomia*) *rufipes* Gough.

Larvae were found breeding commonly in stagnant backwaters of streams and in isolated ponds and ditches.

Distribution : Kalokitting ; Guldu ; Buram ; Niertete ; Jebel Meidob (*Maxwell-Darling*) ; Zalingei.

Anopheles (*Myzomia*) *pretoriensis* Theobald.

Larvae were collected from residual pools in the bed of wadis, from edges of running streams and from pools in marhses.

Males were observed to dance in clouds near a swampy lake at Sibdu at sunset. It was noticeable that malaria was uncommon in the village surrounding this lake.

Distribution : Zalingei ; Jebel Marra ; Niertete ; Guldu and Suni ; Idd el Ghanam ; Buram ; Sibdu.

Anopheles (*Myzomia*) *pharoensis* Theobald.

Uncommon.

Distribution : Jebel Hilla ; Bardei.

Theobaldia longiareolata Macquart.

Breeds in profusion in the Marra Mountains above 6,000 feet. Small pools beside streams are the favourite site, but rock pools and stationary rocky backwaters are frequently chosen.

At Dereiba, in the crater, larvae were numerous in fresh pools beside the salt lake and some were even breeding in the water of the salt lake itself. The following is an analysis of this water in 1941 :—

> " The water is a solution of sodium carbonate (1·262 gms./100 ccs.) and sodium chloride (0·645 gms./100 ccs.) with a smaller quantity of sodium bicarbonate (0·155 gms./100 ccs.). Other salts are present in insignificant quantities."

It was noticeable that the larvae from the salt lake were in general considerably paler than those breeding in the fresh water close by.

Adults were of the pale form.

Distribution : Jebel Marra (above 6,000 feet).

Aëdes (*Mucidus*) *scatophagoides* Theobald.

Larvae were taken mainly from rain pools and borrow pits.

Distribution : El Fasher ; Zalingei.

Aëdes (*Stegomyia*) *aegypti* L.

Widely distributed throughout the province. A careful control of this species was particularly necessary during the war, as the aerodrome at El Fasher was the last Staging Post inside the Yellow Fever endemic area on the main Trans-African air-route to India and the Far East.

Distribution : Widespread.

Aëdes (*Stegomyia*) *metallicus* Edwards.

Bred from larvae found in tree-holes and a concrete basin.

Distribution : El Fasher.

Aëdes (*Stegomyia*) *luteocephalus* Newstead.

Distribution : Jebel Marra ; tree-holes and rock-pools.

Aëdes (*Stegomyia*) *unilineatus* Theobald.

Distribution : El Fasher.

Aëdes (*Stegomyia*) *vittatus* Bigot.

Found breeding in concrete basins, El Fasher, and in rock-pools on Jebel Marra.

Distribution : Jebel Meidob (*A. P. G. Michelmore*) ; Gneina (*E. K. Maurice*) ; El Fasher ; Jebel Marra.

Aëdes (*Aedimorphus*) *quasiunivittatus* Theobald.

Larvae were taken from rock-pools.

Distribution : Jebel Marra, Deriba lakes (*M. Steele*) ; Western slopes.

Aëdes (*Aedimorphus*) *arabiensis* Patton.

Larvae were found in great numbers breeding in temporary rain-pools in the early rains. On one occasion six days after the first rain had fallen at El Fasher, pools in a wadi were teeming with pupae of this species. No other developmental stages were seen and the assumption is that eggs had been laid the season before and had remained dormant and alive through the intensely hot, dry months, to be hatched simultaneously after the first downpour.

Distribution : Widespread in the south and middle of the province.

Aëdes (*Aedimorphus*) *hirsutus* Theobald.

This species, with *A. arabiensis*, was noticeably the most common mosquito breeding in rain-pools during the early part of the rains. It was observed that larvae were in the habit of lying parallel with the surface of the water apparently feeding from the underside of the surface film.

Distribution : Widespread.

Aëdes (*Aedimorphus*) *ochraceus* Theobald.

Distribution : Nyala, rain-pools.

Aëdes (*Aedimorphus*) *circumluteolus* Theobald.

A specimen was found to have a single mesipimeral bristle, just below the patch of scales. A specimen which I took at Wad Medani, on the Blue Nile, was similar on one side only.

Distribution : El Fasher.

Culex (*Lutzia*) *tigripes* Grp. and C.

Larvae were found breeding in a variety of situations in most of which the water was stagnant. However, on Jebel Marra they were found in numbers in backwaters and at the edge of streams where the current was very sluggish.

An adult from Jebel Meidob was of Type 1.

Distribution : Koronga, Murri, Jebel Marra. El Fasher. Malha, Jebel Meidob.

Culex (*Neoculex*) *salisburiensis* Theobald.

Identified from larvae taken from the edge of streams. Lewis has compared a specimen with Eritrean larvae and agrees with the identification.

Distribution : Suni, Jebel Marra.

Culex (*Neoculex*) *arbieeni* Salem.

The occurrence of this species on Jebel Marra, based on the finding of one damaged larva, was noted by Lewis (1945). Since his paper, the observation has been abundantly confirmed by the finding of numerous larvae, some of which were bred to adults. Lewis (personal communication) has examined the male terminalia and compared the specimens with Salem's specimens and drawings, and he states "It seems that they are the same species with a notable variation, namely the spicules on the Sudan larvae."

In Lewis's description of the original specimen he noted that the three distal subventral setae of the siphon were single. However, examination of a large number of the larvae shows that they may be single, double or with three branches. In addition the upper caudal seta may be two- or three-branched, and the ventral brush usually has seven pairs of tufts.

Larvae were taken from the edges of a rocky permanent stream at Suni.

Distribution : Jebel Marra, Suni and on upper slopes.

Culex (*Culiciomyia*) *nebulosus* Theobald.

Found breeding commonly in domestic utensils, it is often mistaken by untrained sanitary overseers for *A. aegypti* and reported as such. In many cases the venter of adults was mostly dark, and not pale as is described by Edwards (1941).

Distribution : El Fasher.

Culex (*Culex*) *poicilipes* Theobald.

Distribution : Buram ; Tulus ; Abu Sal'a.

Culex (*Culex*) *ethiopicus* Edwards.

Note Lewis's (1945) remarks on the impossibility of distinguishing the larvae of *C. ethiopicus* from those of *C. bitaeniorhynchus*. Adults were bred out and compared with larval skins in this series.

Distribution : Malha crater, Jebel Meidob, rock-pool fed by spring. Tulus. Jebel Marra : Koronga, Kabe ; edges of streams.

Culex (*Culex*) *annulioris* Theobald.

An adult male from Murri had coloration similar to that of Edwards's (1941) description of *C. annulioris*, but the appearance of the terminalia approached that of var. *consimilis*.

A second male of the "*gambiensis*" form had terminalia of appearance intermediate between *C. annulioris* and *C. annulioris* var. *consimilis*.

The curved posterior edge of the inner division of the phallosome was more spiculate than the specimen from Elizabethville figured by Edwards (1944).

Distribution : Murri, foot of Jebel Marra.

Culex (*Culex*) *duttoni* Theobald.

Found only in the Divide Range and to the west of it.
Distribution : Zalingei, "wells." Kebkabiya ; Jebel Marra.

Culex (*Culex*) *univittatus* Theobald.

A very common species distributed widely throughout the province. In general the siphon index of larvae was shorter than usual. A batch of eight larvae from a concrete basin in El Fasher had a mean index of 4·9, with maximum 5·2 and minimum 4·5. Three larvae taken on Jebel Marra had siphon indices of 7·0, 5·4 and 6·2.

A female caught beside Deriba lake was of the type with incomplete abdominal bands and few post-spiracular scales mentioned by Lewis (1945).

Distribution : widespread.

Culex (*Culex*) *sinaiticus* Kirkpatrick.

Breeds in profusion at the edges of backwaters and swampy areas beside the swift-running streams on Jebel Marra, though I have not found larvae elsewhere except on one occasion in a borrow-pit at El Fasher.

Lewis (1945) noted that whereas head seta B was single on both sides, in some of the specimens from Jebel Marra and from the Damazin Cataract, in larvae taken elsewhere it has been double at least on one side, and occasionally triple.

Distribution : Jebel Marra (widespread) ; El Fasher.

Culex (*Culex*) *laticinctus* Edwards.

One larva bred to an adult had a siphon index of only 3·2.

Distribution : El Fasher (concrete basins) ; Jebel Meidob (rock-pools fed by spring).

Culex (*Culex*) *pipiens* L.

Found only on Jebel Marra where larvae were taken from the upper slopes and from within the crater, above 8,000 feet. A female bred from a batch from the highest point had the abdominal bands very much reduced. The species was not found below 7,000 feet.

Distribution : Jebel Marra (upper slopes and beside the Deriba lakes).

Culex (*Culex*) *decens* Theobald.

Larvae were taken from a concrete trough and household pots in El Fasher and from a metal tub in Nyala.

Distribution : El Fasher, Nyala.

Culex (*Culex*) *perfuscus* Edwards.

Adults were bred out from larvae with the characters which Hopkins attributed to *Culex* (*Culex*) *perfidiosus* Edwards (Lewis, 1945), but two larvae have one pecten spine with three secondary denticles.

Distribution : El Fasher (concrete trough).

Culex (*Culex*) *grahami* Theobald.

Larvae of this species were taken at Hoy, Kordofan Province, not far from the Darfur border, and probably occur within the province.

The larvae differed from Hopkins' (1936) description in the following characteristics :

Antennae slightly longer than head—Set D. double—Siphon index 10.5 ; Gills : dorsal pair slightly longer than ventral and 3 times the length of the saddle.

The species has not previously been reported from the Sudan.

Distribution : Hoy, Kordofan Province (rain-pool).

(*b*) *The Mosquitoes of the Marra Mountains.*

At the edges of the streams in the foothills of the mountain, which lie at about 3,000–4,000 feet, *A. pretoriensis* and *Culex sinaiticus* are abundant breeding among the reeds and weedy backwaters. *A. funestus* and *A. leesoni* were found on one occasion, both being identified from larvae.

In the streams above 6,000 feet and up to 8,000 feet the only Anopheline to be taken, and that in great abundance, was *A. cinereus*. Of the Culicines, *C. sinaiticus* and *C. arbieeni* were common. *C. pipiens*, *C. ethiopicus* and *C. univittatus* were taken less frequently, and two males of *C. annulorius* were bred from larvae taken at this level. *Theobaldia longiareolata* occurred in vast numbers in small pools adjacent to streams and in stationary backwaters of the streams themselves.

In the upper zone no larvae were found in springs on the central plain at 8,000 feet, but in fresh water springing from the edges of the great crater, *C. pipiens* and *Theo. longiareolata* larvae were in abundance, and some larvae of *C. univittatus* and *A. cinereus* were taken. Adults of *C. univittatus* were taken on the wing beside the lakes.

At the edges of the "fresh" lake in the inner cone no aquatic insects were seen ; the water was presumably too hot. However, a small pool beside this lake was teeming with larvae of *Theo. longiareolata* and *C. pipiens*.

In the water of the "salt" lake, larvae of *Theo. longiareolata* were found.

ZOOGEOGRAPHY.

(*a*) *Zoogeographical position of the area.*

Darfur Province lies in both the Sudan Arid Belt and the Sudan Savannah of Chapin, the division between the two lying roughly on the 400 mm. isohyet (Whitfield, 1933). Thus the Savannah Belt comes to include the whole of the Western Plain, the Divide Range, and the southern half of the Eastern Plain, whilst the Arid Belt comprises the northern half of the Eastern Plain.

The Marra Massif, however, shows such differences in vegetation, climate and mosquito fauna that it should perhaps be regarded as an area separate from the rest of the province in the zoogeographical sense.

(*b*) *The Mosquito Fauna.*

The mosquitoes found on the plains are for the most part species which occur widely in the Ethiopian region, though there are some whose presence in this area is of more interest. Such are :

(1) *Anopheles rupicolus* and *Aëdes arabiensis*, not previously found as far west as this.
(2) *C. laticinctus*, found in Arabia and the uplands of East Africa, and which is widespread in the Mediterranean region.
(3) *C. grahami*, previously known only in the west, the southern Congo Savannah district and Kampala in Uganda.

The mosquitoes of Jebel Marra are of great interest for here we observe a fauna predominantly of the East African highland type, with other essentially temperate species, and one previously known only from Mount Sinai.

These species of interest are :

Anopheles leesoni.
Anopheles marshalli.
Anopheles cinereus.
Theobaldia longiareolata.
Aëdes quasiunivittatus.
Culex salisburiensis.
Culex arbieeni.
Culex sinaiticus.
Culex pipiens.

(*c*) *Comment.*

"The present distribution of mosquitoes, as of any other group of animals or plants, is conditioned not only by present factors of climate, association or isolation, but also by the permanence or changes of these factors in the past and by evolutionary changes in the organisms themselves. Present distribution may therefore throw light on past events and *vice versa*, though any discussion on either aspect must be largely conjectural"—(Edwards, 1941).

The climate of North Africa has not always been as it is today. On the contrary, all the available evidence from the geological succession, the fossil record, and the recorded history and state of preservation of monuments points to great changes in the past.

It would seem that throughout glacial times there was an alternating series of dry and wet periods, each succeeding wet period being less wet and of shorter duration than the one preceding, and the dry periods also becoming shorter and less dry.

In tabular form this sequence of wet and dry climates may be represented as follows :

Age	Climate
Recent	Present climate.
	Nakurian Minor Wet.
Pleistocene or Glacial Upper ...	Present climate.
	Makalian Wet.
	Dry.
	Gambian Pluvial.
Middle Pleistocene	Dry.
	Kamasian Pluvial.
	Dry.
Lower Pleistocene, Plio-pleistocene and Pliocene	Kisegian Pluvial.

It is to be inferred that during the wet periods the prevailing temperatures were very much lower than they are now, and it is on this reasonable reconstruction of the climate of the past that one can base

a probable explanation of the presence of Mediterranean and East African Highland species on the Marra Mountains.

It may well be that these species were spread widely over the north-eastern parts of the continent during these early cool periods, and that during the intervening periods of dessication they found conditions suitable for existence only in the East African Highlands and in those isolated areas where the climate had not undergone such a marked change.

The Jebel Marra Massif is one of such areas, and it is probable that the Tibesti Hills of the north-west will also prove to carry a similar fauna.

Good (1924), quoted by Balfour-Browne (1943), while discussing the flora of the Marra Massif, suggests that the North-East African affinities are 87 per cent. ; an observation which would support our hypothesis, and which could hardly be reconciled with Edwards' (1941) suggestion that the Mediterranean species spread down to the south via the Eastern Highlands. Balfour-Browne states, however, that while a distinct Egypto-Syrian element was to have been expected, yet the APIONINAE taken on the massif have so far been predominantly of the Ethiopian group. Perhaps a larger collection of this group will yet reveal a greater affinity with the north, thus bringing it into line with the CULICIDAE and the flora.

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FURTHER NOTES ON THE BEETLE GENUS *LACHNOSTERNA* (COL. : MELOLONTHINAE), WITH DESCRIPTIONS OF THREE NEW GENERA.

By Gilbert J. Arrow, F.Z.S., F.R.E.S.

(*British Museum (Natural History)*).

Two genera, *Holotrichia* and *Lachnosterna*, were described by Hope on successive pages of *The Coleopterist's Manual*, part I, 1837, pages 99 and 100. In the Munich Catalogue (1869) *Holotrichia* was treated as a synonym of *Lachnosterna*, but Dalla Torre's (Junk) Catalogue of 1912–13 revived it for Old World species and employed *Lachnosterna* for those of the New World. Mr. Saylor (1942, *Proc. U.S. nat. Mus.* **92** : 147), substituting the names *Ancylonycha* for *Holotrichia* and *Phyllophaga* for *Lachnosterna*, has formed three new genera from the latter and united certain others with it. He has also pronounced *Holotrichia* and *Brahmina* synonymous.

I have given at some length in 1944, *Ann. Mag. nat. Hist.* (11) **9** : 631, my reasons for being unable to admit the validity of the names *Phyllophaga* and *Ancylonycha*, which were originally published without descriptions. I also confessed my inability to find grounds for the separation of *Lachnosterna* and *Holotrichia* ; and Mr. Saylor, while not uniting them, has not attempted to supply reasons for their separation. He considers *Lachnosterna* (=*Phyllophaga*) to be essentially characterised by the presence of a transverse ridge near the middle of the tibiae of the intermediate and hind legs, although sometimes absent from the hind legs of the male.

Although entire tibial ridges, such as occur in American species, are not commonly found in Old World species, they may be present (*e.g.*, in *Lachnosterna vidua* Sharp and *rufoflava* Brenske) and exist in all stages of incompleteness. In some species, including *serrata* Fabricius, that selected by Hope as the type of his genus *Holotrichia*, the hind tibia bears a complete ridge and the middle tibia an incomplete one ; in others (*e.g.*, *bengalensis* Brenske) the ridge may be complete upon the middle leg but not upon the hind one, as in some American species. There may be considerable variation amongst the individuals of a species and in some, such as *Holotrichia imitatrix* Brenske (of which *H. tuberculipennis* Moser is the female) there is a complete ridge in the female but not in the male. It is not possible therefore to separate the New and Old World forms generically by this means and until some really distinctive character is found there appears no alternative but to treat them as a single genus. I have recently used the name *Holotrichia*, in accordance with the latest catalogue, for some Oriental forms, but *Lachnosterna*, so long in general use both in Europe and America, is certainly to be preferred. The first appearance of the name *Holotrichia* upon the preceding page to *Lachnosterna* is of course no real priority.

Mr. Saylor has formed a new genus, *Cnemarachis*, for West Indian species in which the tibiae bear a series of teeth but no transverse ridge. He has not mentioned another feature which has been considered of some importance, namely that the antennae in this genus are composed of nine, instead of ten, segments, the seventh being suppressed. In first characterising the genus *Ancylonycha* in 1845, Blanchard stated only that the antennae consist of nine segments, the last three forming a small club, and that the labium is broad and a little pointed in front. No species were mentioned, but in the list published five years later (1851, *Cat. Coll. ent. Mus. Paris*) those with nine-jointed antennae constitute his Division 2 and consist chiefly of the West Indian species for which Mr. Saylor has established the genus *Cnemarachis*, *Ancylonycha hogardi* Blanchard being placed at their head. Seven West Indian species were described by him as new and five other American species included. These five were placed at the end of Division 2, evidently because he was not sure of their belonging to the group, for, of those known to me, only one, *diffinis* Blanchard, has antennae of nine segments. In the North American *micans* Knoch and *hirsuta* Knoch there are ten segments and in *mexicana* Blanchard eight. The Brazilian *pectoralis* Blanchard is unknown to me.

It is clear that the West Indian insects for which Mr. Saylor has now introduced the name *Cnemarachis* were those which Blanchard had in mind in 1850 when he first defined the genus *Ancylonycha*. Mr. Saylor, regarding that name as made valid by Duponchel in 1849 by the designation of *Melolontha serrata* Fabricius as its type, substitutes it for *Holotrichia* Hope, but the same species had been already named as the type of *Holotrichia*, which (with *Lachnosterna*) had become valid in 1837 and cannot be a synonym of one not valid until 1849. Blanchard's diagnosis of 1845, although certainly excluding *serrata* Fabricius, is so inadequate ("antennes de neuf articles, les trois derniers formant une petite massue. Lèvre inférieure large et un peu avancée en pointe," the "pointe" being quite imaginary) that it is a little unfortunate the name has been rescued from the obscurity to which it was long ago consigned.

Blanchard's Division 3, in which the Oriental species in his list are placed, although defined as having antennae of ten segments, includes an Indian species, *coromandeliana* Blanchard, which is one of a well-defined group of Oriental species in which not only do the antennae, as in *Ancylonycha* Blanchard, consist of nine segments but the middle and hind tibiae also are toothed in a similar manner to the West Indian species of that genus. It is difficult to resist the conclusion, despite the wide separation of their habitats, that some relationship exists between the two groups. I propose to form a new genus *Neodontocnema* for the Oriental group.

Neodontocnema gen. n.

Body cylindrical, compact and convex, very closely and evenly punctured above, where it is naked, the metasternum and hind coxae thickly clothed with pale hair. Head small, clypeus and forehead very short, vertex very sharply carinate, the clypeus strongly recurved, its front margin deeply or slightly excised in the middle. Antennae composed of nine

segments, 3 and 4 nearly equal, 5 and 6 very short, club of three lamellae. Legs moderately long, the front tibiae strongly tridentate, middle and hind tibiae without complete transverse ridge near the middle (except in some females), but each with three or four longitudinally arranged teeth posteriorly in the anterior half. Claws bearing a strong vertical tooth beneath.

Genotype : *Ancylonycha coromandeliana* Blanchard. Southern India.

In addition to *coromandeliana*, I refer to the genus the following species.

Melolontha abdominalis Hope (Nepal, Assam), *Holotrichia hybrida* Moser (Assam), *H. tuberculipennis* Moser (Assam, Upper Burma), *H. diversiceps* Moser (Sikkim), *H. imitatrix* Brenske (Sikkim), *H. bilobata* Moser (? Kanara), *H. excisa* Moser (S. India), *H. formosana* Moser (Formosa), *H. castanea* Waterhouse (Japan). All these are known to me with the exception of *hybrida* Moser and *imitatrix* Brenske. It seems not impossible that *bilobata* Moser, of which the recorded habitat of the unique type in the British Museum is not quite certain, may be synonymous with *imitatrix* Brenske. *H. conferta* Sharp (type also in the British Museum) is a synonym of *M. coromandeliana* Blanchard. *N. abdominalis* Hope has been omitted from the catalogues. It was described in Gray's *Zool. Misc.*, 1831, page 23.

An insect agreeing closely with those just enumerated, except that the tibiae are without the characteristic series of teeth and the pronotum bears a curious crest of long hairs in the middle line, was named *Holotrichia sus* by Moser. For this and a new species closely related it seems necessary to form another genus, which may be called

Hippotrichia gen. n.

Body long and cylindrical, closely and regularly punctured above, the pronotum bearing a close brush of long erect hairs, placed longitudinally upon the middle line, the elytra with a juxta-sutural costa only. Head short, with the vertex very sharply carinate and the clypeal margin strongly recurved and feebly excised. Antennae composed of nine segments, the club very small. Middle and hind tibiae with single lateral teeth but no complete median carina, the claws with a strong tooth near the middle.

Genotype : *Hippotrichia hainana* sp. n.

Hippotrichia hainana sp. n.

Red, including the legs, with the elytra and abdomen yellow, the former rather pale. Elongate, compact, very convex, not very shining, the metasternum closely clothed with moderately long pale hair. Head finely and densely punctured, clypeus very short, the punctures rather less fine and dense, the front margin strongly reflexed and almost straight. Pronotum finely punctured, the punctures dense near the middle, becoming less so towards the sides, where it is shining, the middle line bearing upon its anterior half a crest of long pale erect hairs, which is followed by a small, smooth and shining area, the lateral margin straight and reflexed in front, strongly rounded behind, the front angle slightly obtuse, the hind angle obsolete, scutellum short and densely punctured, elytra finely, closely and evenly punctured. Pygidium shining, strongly, deeply and not closely punctured. Abdomen finely and closely punctured at the sides, almost unpunctured in the middle.

Length 21 mm.

Hainan I. (*J. Whitehead*). Type, male, in the British Museum collection.

This species resembles *H. sus* Moser, from which it differs chiefly in the much finer and closer puncturation of the elytra. In the single female specimen from Cochin-China described by Moser the elytra are said to be coarsely rugose. In examples taken by Vitalis on the Upper Mekong

(Muong-Sing), belonging to that or a closely similar species, they are finely but not very closely punctured in the basal part, very coarsely and roughly punctured in the median part and again finely but not closely in the posterior part. In the new species they are closely, rather finely and almost uniformly punctured everywhere. The front edge of the clypeus is broadly emarginate in *H. sus* but only very feebly in *H. hainana*. The prothoracic crest is said by Moser to form a longitudinal series of long yellow hairs. These, in the Vitalis specimens, extend from front to hind margin. In the new species they extend little past the middle and are followed by a small, completely unpunctured, space. The legs are not described by Moser, but in the Vitalis specimens the hind tibiae are narrow at the base and seem to dilate rapidly owing to the appearance at the inner edge of a strong blunt tooth or lobe. In the type of *H. hainana* the dilatation is more gradual and the tooth quite small. This may not be a specific difference since the type of *H. hainana* is a male, while the other specimens, including Moser's type, are females. The aedeagus of the male *H. hainana* has a rather singular form, the paramera being drawn out to form two pairs of long and slender processes, dorsal and ventral, the former meeting at the tips, the latter abruptly diverging there. The internal sac is armed with very strong spines.

Yet another Oriental insect, with antennae composed of nine segments and of which the claws differ in male and female, appears to belong to a genus and species hitherto unknown. I propose to call it

Pahangia gen. n.

Moderately elongate, shining, bearing scattered minute setae above and short grey hairs upon the legs and the sides of the body beneath. Labrum thickly clothed with hair, deeply excised. Mandibles with strong cutting edge. Maxillae without sharp teeth, bearing a brush of suctorial hairs, the palpi clothed with long hairs. Labium transverse, divided by a deep groove, the palpi attached at the edges. Antennae composed of nine segments, 3 a little longer than 4, 5 short, 6 very short, the last three forming a short club. Head not carinate. the clypeus straight in front, the eyes small. Front angles of pronotum sharp, hind angles very blunt. Prosternum elevated behind the front coxae. Metasternum pointed in front, not produced. Abdomen tapering behind, the pygidium oblique. Legs rather slender, front tibiae tridentate, middle and hind tibiae with incomplete transverse ridges. Claws differing in male and female, broad except at tip, with a minute basal tooth.

Genotype : *P. costata* sp. n.

Pahangia costata sp. n.

Dark brown, shining, with extremely minute and inconspicuous white setae above and fine yellowish hair beneath, close at the sides and becoming scanty towards the middle. Head large, clypeus densely and confluently punctured, its front margin strongly reflexed, straight in the middle, rounded at the sides, forehead finely and closely punctured ; pronotum short, its surface uneven, strongly and rather closely punctured, a little impressed in the middle and near the front angles, the lateral margins straight in front and rounded behind, the front angles rectangular and hind angles almost obsolete, scutellum semicircular, finely punctured ; elytra with strong juxta-sutural costa, a sharp lateral and three dorsal costae, the outermost abbreviated in front, the intervals rather closely punctured. Pygidium strongly and subrugosely punctured. Metasternum closely punctured at the sides, sulcate, smooth and shining in the middle.

♂, abdomen slightly hollowed beneath, the middle and hind legs very slender, the claws long, with a small, sharp tooth before the tip.

♀, legs stouter, hind femur thick, hind tibia dilated at end, claws with strong tooth in the middle.

Length 22–24 mm.

FEDERATED MALAY STATES : Gunong Tahan, 2,500–3,500 feet (*type*), Pahang (*H. C. Robinson*). Jelebu, Negri Sembilan. Types, ♂ and ♀, in the British Museum collection.

This insect is less nearly related to *Lachnosterna* than those just described. The reduction in the number of antennal joints may have occurred independently. It appears to be a rather isolated form, perhaps more nearly related to *Lepidiota*.

The genus *Brahmina*, pronounced synonymous with *Holotrichia* by Mr. Saylor, was separated by its author, Blanchard, by reason of its claws being cleft and not toothed. I described a Trinidad insect, *Lachnosterna dilemma*, in 1920, in which these two forms of claw distinguished the two sexes, and I have more recently described a similar instance in a species from Burma. The generic name *Anomalochela* was given by Moser to another related species from Southern India on account of a similar difference in the claws of the two sexes, but the name can hardly be retained since the species which agree in this particular respect show no other indications of special relationship and the only other features, of the male alone, mentioned by Moser, have no generic value. I therefore consider that genus, as well as *Brahmina*, synonymous with *Lachnosterna*. The very abundant Indian *Brahmina calva* Blanchard may be taken as the type of Blanchard's genus. An older name for this species is *Melolontha coriacea* Hope and a later one is *Schizonycha cribricollis* Redtenbacher. The various species assigned to *Brahmina* in the Dalle Torre catalogue are by no means homogeneous and I have already removed several of them to the genus *Sophrops* Fairmaire (see 1946, *Ark. Zool.* 38 A (9): 20). In the same paper I unfortunately described two Burmese species as *Holotrichia malaisei* and *Brahmina malaisei*, although mentioning the difficulty of choosing the correct genus. Since both are now to be called *Lachnosterna* I desire to change the name of the former to **L. parvioculata** (*nom. nov*).

An insect from Tonkin called by Fairmaire *Phytalus latericostatus* was declared by Brenske to belong without doubt to the genus *Brahmina*, although known to him only by the description. It has a clothing of scales and actually belongs to Moser's genus *Dasylepida*, which in 1938 I restricted to a single species, *D. fissa* Moser. That species has the highly unusual feature, not noted by Moser and not found in *D. latericostata* Fairmaire, that the hind claws are asymmetrical, the outer one being cleft and the inner strongly toothed. This is more pronounced in the female than in the male.

A species of particular interest, as showing the transition from one form of claw to the other and the consequent impossibility of employing these for generic division, was sent to Brenske many years ago and referred by him, although not described, to the genus *Brahmina*. I propose to call it

Lachnosterna punjabensis sp. n.

Reddish brown, shining, clothed with pale hair above and beneath, short and not very

close upon the upper surface and abdomen, erect on the upper surface, longer and thicker on the metasternum and hind coxae.

Cylindrical, not very long, with the head small, the clypeus closely punctured, its margin gently excised in the middle, strongly rounded on each side, the forehead closely rugose and transversely carinate in front, the carina usually interrupted in the middle, sometimes reduced to two short elevations ; pronotum strongly but not closely punctured, the lateral margin finely crenate, strongly contracted in front and behind, the front angles well marked and hind angles wanting ; elytra and pygidium strongly and rather closely punctured. Legs slender, the middle and hind tibiae without transverse ridge.

♂, antennal club rather long, claws broad, narrowly cleft at the tip.

♀, antennal club short, claws bearing a very short tooth or deeply cleft, with divergent tips.

Length 10·5–13 mm.

PUNJAB : Thobba, Murree Hills (*Major Howland Roberts*) (*type*).

UNITED PROVINCES : Ranikhet, W. Almora (*H. G. Champion*), May.

Many specimens were contained in the large collection of Punjab insects made many years ago by the late Major Howland Roberts. The types are in the British Museum collection. They show the species to be a peculiarly variable one. The frontal carina may be entire, interrupted, reduced to a pair of transverse tubercles or almost absent. The antennal club is of rather variable length in both sexes, although always much shorter in the female. The abdomen of the male may be hollowed beneath or not. The claws of the female may bear a very short tooth near the middle or may resemble those of the male except in the two divisions diverging, with the inner one much shorter than the outer.

In Mr. Saylor's paper, already quoted, in addition to *Brahmina* a number of other Melolonthine genera are named as known to him, of which he regards some as valid and others, not specified, as apparently not valid. Three of these belong to the Madagascan fauna, two of them, *Empecta* and *Encya*, being, I think, unassailable. The third, *Hoplochelus*, is less easily distinguished from *Lachnosterna* and, like Burmeister and Lacordaire (the latter including it in *Rhizotrogus*), I have failed to find any satisfactory character to maintain it. It was created by Blanchard in his *Cat. Coll. ent. Mus. Paris* (1851) for *H. rhizophagoides* Blanchard, while two related species, *piligera* Blanchard and *micantipennis* Blanchard, were wrongly assigned by him to *Empecta* Erichson. A closely related species from the island of Rodriguez was called by Waterhouse *Lachnosterna gradaria* and the Madagascan habitat was probably Blanchard's chief reason for not attaching the species described by him to the genus.

Although it is likely that future study will result in the discovery of adequate reasons for detaching various groups from the rather heterogeneous mass of species now composing this great genus, I consider that, for the reasons given here, the following names must be treated as synonyms :

Lachnosterna Hope, 1837. (Genotype, *Melolontha fervida* Fabricius.)
Holotrichia Hope, 1837. (Genotype, *Melolontha serrata* Fabricius.)
Brahmina Blanchard, 1851. (Genotype, *B. calva* Blanchard.)
Hoplochelus Blanchard, 1851. (Genotype, *H. rhizotrogoides* Blanchard.)
Anomalochela Moser, 1913. (Genotype, *Brahmina bicolor* Brenske.)

Ancylonycha Blanchard, 1845. (Genotype, *A. hogardi* Blanchard.)
Cnemarachis Saylor, 1942. (Genotype, *Lachnosterna vandinei* Smyth.)

NOTE ON THE SEXUALES OF *STATICOBIUM LIMONII* (CONTARINI, 1847) (HEMIPTERA, APHIDIDAE)

By F. H. Jacob.

(*Ministry of Agriculture and Fisheries, National Agricultural Advisory Service, Bangor, North Wales.*)

Hille Ris Lambers (1939) gives a detailed account of the synonymy, morphology and affinities of the genus *Staticobium* Mordvilko, but his account of *Staticobium limonii* (Contarini) does not include descriptions of the sexuales. In the autumn of 1946 these forms were sent to Dr. D. Hille Ris Lambers, whose own specimens collected in 1943 had been lost during the German occupation of the Netherlands, and as these Welsh specimens appear to differ slightly from the continental ones, he suggested that they should be described by the writer.

Oviparous female.

Living specimen: Rather smaller than apterous viviparous female, more globose, abdomen pointed. All the specimens seen were light reddish brown in colour. Siphunculi short and dark brown to black, basal half lighter than distal half. Cauda pale yellowish brown. Legs light brown with dark coxae, trochanters, "knees," apices of tibiae and tarsi. Hind tibiae very slightly swollen.

Macerated specimen: Similar to apterous viviparous female in shape. Chaetotaxy similar but the small scleroites at the bases of the hairs are less distinct: the eighth tergite generally with 2, sometimes with 3 or 4 hairs. Shape of head as in apterous viviparous female. Antennae 5/8–7/8 as long as body; third segment with 0–2 small secondary rhinaria near the base; antennal hairs at most 5/8 as long as the basal diameter of the third segment; processus terminalis slightly less than three to slightly more than four times as long as base of sixth segment. The rostrum reaches to the third coxae; the last segment is 7/9—equally as long as the second joint of the hind tibiae. Siphunculi about 1/9–2/3 as long as the body, not so broad based as in the apterous viviparous female, but with similar imbrications and reticulations over the distal 5/16–3/7; they are dark brown and sclerotic. Cauda colourless, triangular but thicker than in apterous viviparous female; about 15/18–15/14 as long as the siphunculi, with 8–12 hairs, generally 9 or 10, arranged in three lateral pairs and 3 or 4 hairs near the apex. Legs normal, hind tibiae with basal half slightly enlarged and bearing a variable number (17–55) of small pseudosensoria on the enlarged portion.

Described from eighteen specimens.

Measurements of a single macerated specimen: Length of body, 2·47 mm.; antenna, 1·71 mm.; siphunculi, 0·30 mm.; cauda, 0·28 mm.; proportion of antennal segments: $\frac{100}{III}$, $\frac{72}{IV}$, $\frac{64}{V}$, $\frac{24+100}{VI}$; secondary rhinaria on III: 1 and 1.

Apterous male.

Living specimen: Smaller than other stages. Conspicuous in colonies because they are dark green in colour. Siphunculi dark brown with darker tip. Cauda colourless. Antennae dark brown except for the very base of the third segment, which is lighter.

Macerated specimen. Body oval, often rather broad. Head as in other stages. Abdomen with well-developed intersegmental sclerites, small to well-developed antesiphuncular

sclerites and very well-developed postsiphuncular sclerites. Sometimes small weakly pigmented marginal sclerites and irregular pigmented sclerotic areas on the sixth, seventh and eighth tergites. Dorsal hairs with distinct small scleroites near their bases. Eighth tergite with 2 hairs. Antenna shorter than body 5/8 to equal in length, may be lightly or heavily pigmented; when lightly, I and II and tips of III, IV, V and whole of VI are dark brown; when heavily, the very base of III is light and the remainder dark brown; processus terminalis $3\frac{2}{7}$–$4\frac{5}{6}$ as long as the basal part of VI; III with 17–35, IV with 7–17, V with 3–9 small round secondary rhinaria along one side; longest hairs on antenna 3/9–5/9 as long as the basal diameter of III, but the thickness of the antenna varies considerably. Rostrum reaches to third coxae, last joint is about 7/8–7/9 as long as the second joint of the third tarsus. Siphunculi almost cylindrical, may be very slightly enlarged at base, with typical imbrications and reticulations on distal 3/11–5/12; brown and sclerotic. Cauda triangular colourless, with 3–6 hairs, but there is evidence that hairs have been lost in most of the specimens examined; cauda 8/10–12/11 as long as the siphunculi. Legs normal. Genitalia very well developed.

Described from twelve specimens.

Measurements of a single macerated specimen: Length of body, 1·86 mm.; antenna, 1·70 mm.; siphunculi, 0·20 mm.; cauda, 0·16 mm. Proportion of antennal segments: $\frac{100}{III}, \frac{76}{IV}, \frac{60}{V}, \frac{24+100}{VI}$. Secondary rhinaria $\frac{17 \text{ and } 24}{III}$, $\frac{10 \text{ and } 12}{IV}$, $\frac{7 \text{ and } 7}{V}$.

The eggs are light green when laid; they turn to dark green and eventually to black.

The aphids were found on the fresh flower spikes and basal leaves of *Limonium humile* (Mill) growing on some very sheltered mud flats near Holyhead, Anglesey, on 5th August and 6th September, 1946, no sexuales being found on former date.

Note.

There are certain differences between the aphids here described and the account given by Hille Ris Lambers (1939). The most striking difference is in the number of hairs on the eighth tergite: Hille Ris Lambers states 4 or 5 for the apterous viviparous female, but in twenty specimens from Anglesey eighteen had 2 and two had 3. It is possible that owing to frequent submergence in muddy water hairs may be lost, but the specimens collected were remarkably clean. There is also a slight difference in the relative lengths of siphunculi and cauda. Some of the Anglesey specimens have the cauda slightly longer than the siphunculi, whereas Hille Ris Lambers states that the cauda is 3/4–6/7 as long as the siphunculi; most of the above specimens fall slightly above this range.

Finally, the host-plant is different. While it is thought that these specimens may belong to a geographical race of *Staticobium limonii* (Contarini), there does not seem to be any reason to go any further than this.

References.

Hille Ris Lambers, D., 1939, Contributions to a Monograph of the Aphididae of Europe. II. The genera *Dactynotus* Rafinesque, 1818; *Staticobium* Mordwilko, 1914; *Macrosiphum* Passèrini, 1860; *Masonaphis* nov. gen.; *Pharalis* Leach, 1826. *Temminckia* **4**: 1.

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